

Summary of the North-of-the Delta Offstream Storage Investigation Progress Report

Background

In early 1995, the CALFED Bay-Delta Program was established to formulate a long-term plan for addressing environmental and water management problems associated with the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. Since then, CALFED agencies and stakeholders have been working to develop a balanced plan to restore ecosystem health, improve levee stability in the Delta, and improve water quality and water supply reliability. After initial evaluations and extensive stakeholder input, the study to address supply reliability evolved into an all-inclusive analysis of water management tools: water use efficiency (conservation and recycling), water transfers, operational strategies (such as real-time diversion management), conveyance, and storage. The overriding objective of the supply-reliability analysis is to develop a comprehensive water management strategy for using all of these tools in the most effective combination to achieve supply reliability goals.

In early 1999, CALFED consolidated all storage investigations under the Integrated Storage Investigations Program, a comprehensive effort to evaluate the feasibility of ground and surface water storage options, and operational strategies. Early in the process, CALFED compiled a list of 52 potential surface storage projects in the Central Valley and began an initial screening to reduce the number of sites to a more manageable number for more detailed evaluation. CALFED was specifically looking for potential sites that could provide broad benefits for water supply, flood control, water quality, and the ecosystem. The screening of potential surface storage projects is intended to be consistent with the federal Clean Water Act Section 404 alternative analysis requirements.

The initial screening identified and eliminated reservoir sites that were clearly impracticable. This elimination process was based on minimum storage capacity (200 thousand acre-feet), potential conflict with CALFED's restoration programs, and CALFED's solution principles and policies. An interagency team of CALFED agencies cooperated to complete the initial screening, which was based on available information. Forty surface storage sites were removed from the initial list. The remaining storage sites are:

- Four north-of-the-Delta offstream storage alternatives: Red Bank Project, Thomes-Newville Project, Colusa Reservoir, and Sites Reservoir.
- In-Delta storage and enlargement of Los Vaqueros Reservoir.
- Four south-of-the-Delta storage alternatives: Ingram Canyon Reservoir, Quinto Creek Reservoir, Panoche Reservoir, and Montgomery Reservoir.
- Enlargement of Shasta Lake and Millerton Lake.

3/14/00 Draft

Figure S.1 shows the location of the 12 remaining reservoir sites. For more detailed information about the initial screening, please refer to the Draft Initial Surface Water Storage Screening, CALFED Bay-Delta Program, December 22, 1999. (This report will be finalized in the near future.)

The second screening of surface storage sites is being performed at a more detailed level and based on more specific project purposes. This process will evaluate the remaining reservoir sites based on detailed project purpose and environmental, engineering, and economic analyses.

North-of-the Delta Offstream Storage Investigation

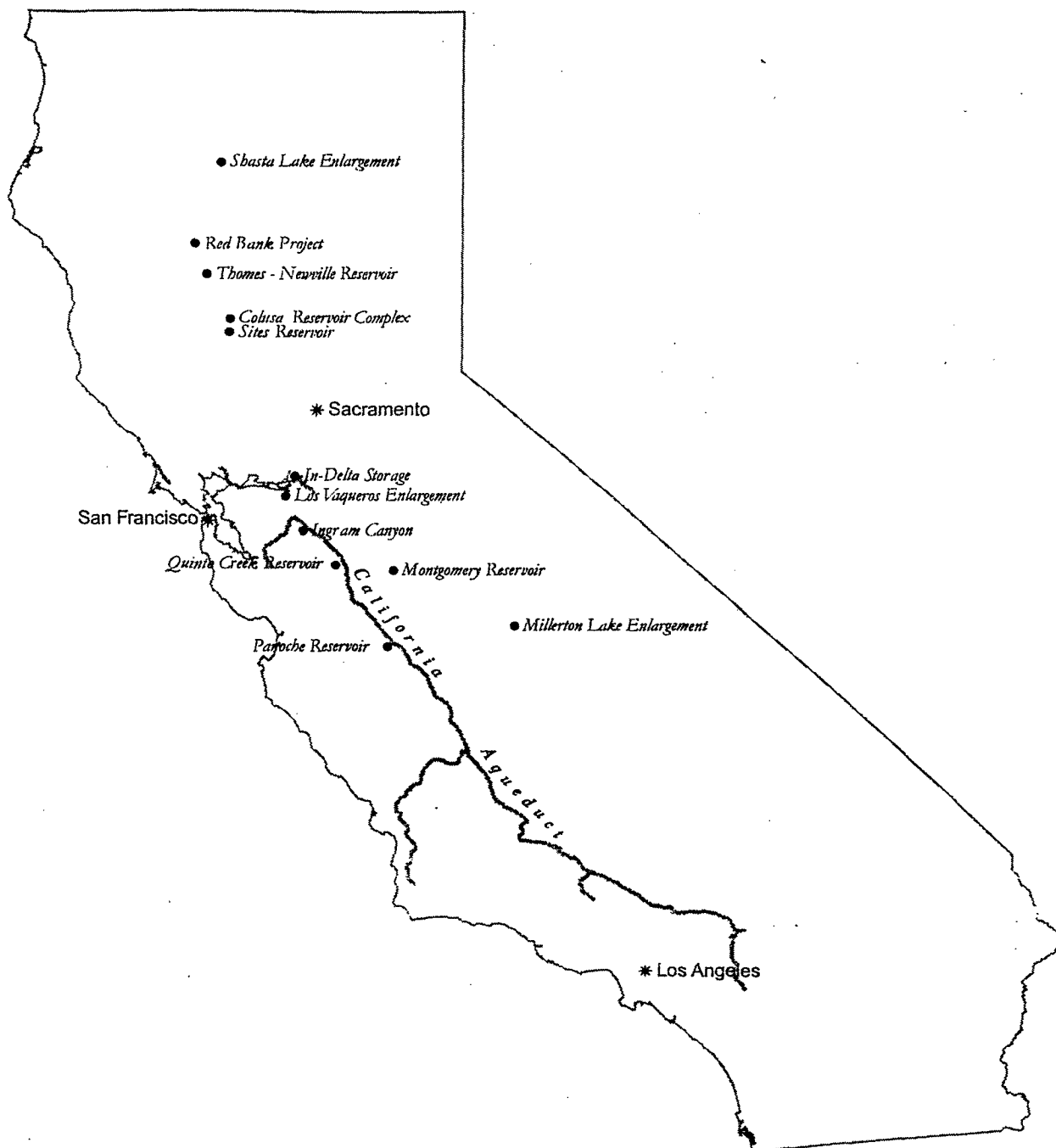
Offstream storage north of the Delta would allow water to be diverted and stored during winter and early spring, when the Sacramento River and local stream flows are highest, which could reduce flood damage downstream. Then, from May through October, water from the reservoir could be released for irrigation and wetlands in the Colusa Basin in exchange for diversions that would have occurred from the Sacramento River.

Such a water exchange program would reduce diversions from the Sacramento River during irrigation season, thereby reducing fishery impacts. The exchange would provide for increased storage and cooler water during the spring and early summers since water that would have been diverted from the Sacramento River for local irrigation could instead be kept in Shasta Lake and later become available for other downstream uses. In addition, the supply remaining in Shasta Lake could be used to provide cooler water to benefit winter-run salmon in the Sacramento River. The added supply in dry periods could also enhance water management flexibility, which could result in additional ecosystem benefits.

An extensive environmental inventory, detailed engineering analyses, and geological exploration are under way as part of the North-of-the-Delta Offstream Storage Investigation. The California Department of Water Resources, in cooperation with CALFED, is conducting this investigation to determine the feasibility of the four north-of-the-Delta sites named above. Information gathered will be used for screening and for environmental documentation, permits, and project feasibility evaluations. This process will lead to selection of a preferred alternative for North-of-the-Delta offstream storage. The North-of-the Delta Offstream Storage Investigation Progress Report summarizes work conducted during the last two years.

While the investigation is not complete, this status report has been prepared to document findings to date. The report provides information to CALFED agencies and the public about the projects under evaluation. Comments received from the agencies and other stakeholders on the direction of the work in progress and future program activities will help formulate a sound and balanced program.

Figure S.1
Integrated Storage Investigations
Potential Surface Water Storage Alternatives



The investigation consists of three phases. Phase I included field surveys of environmental resources; geological, seismic and foundation evaluations; potential environmental impact evaluations; engineering analyses; and studies of the costs and relative advantages of the four alternative sites. The surveys and analyses completed thus far have provided basic information on the costs, benefits, and potential impacts of North-of-the-Delta offstream storage for consideration in CALFED's programmatic Environmental Impact Report/Environmental Impact Statement. Phase II will include preparation of a feasibility report, environmental documentation, and the permits necessary to construct the project. Phase III will consist of final design and construction and proceed contingent on findings during the Phase II investigation.

Project Schedule

Figure S.2 (at the end of this summary) shows the schedule for Phase I and Phase II of the North of Delta Offstream Storage Program. Phase II consists of an environmental documentation and permit process which will start in mid-2000 after the Record of Decision for CALFED's Programmatic EIR/EIS is filed and if additional north-of-the-Delta offstream storage is consistent with CALFED's preferred program alternative. The schedule is subject to several important constraints. The CALFED Program has linked the implementation of surface storage projects with achieving specific objectives in other areas such as the water use efficiency program. Therefore, acquiring regulatory permits and beginning construction of new surface storage projects can only take place after specific actions on water use efficiency are implemented and threshold levels for water use efficiency are satisfied. Water use efficiency is one of eight early implementation actions in Stage 1 of CALFED's Programmatic EIR/EIS. While Stage 1 actions are undertaken, the North of Delta Offstream Storage Program will begin environmental documentation and feasibility evaluation for potential project alternatives and will move forward if the CALFED linkages and conditions are satisfied.

The Offstream Storage Program schedule is also subject to requirements imposed by the National Environmental Policy Act, California Environmental Quality Act, the Clean Water Act, and other laws and regulations that pertain to surface storage projects. CEQA requires public agencies to prepare an EIR that addresses environmental impacts, mitigation measures, alternatives, and public comments and responses. Project-specific CEQA/NEPA processes for surface storage projects can be initiated after the Record of Decision for the CALFED Programmatic EIS/EIR is issued.

Section 404 of the Clean Water Act has significant implications for proposed surface water storage projects, particularly the scope of alternative evaluations. Section 404 has been interpreted broadly and requires a reservoir project proponent to undertake an extensive evaluation of alternatives and to select the "least environmentally damaging practicable alternative". In addition to the nonstructural alternatives considerations (such as water use efficiency), different storage site alternatives should be evaluated to determine which alternative has the least environmental impacts. This evaluation includes detailed field surveys that follow multi-year protocols to identify the existence of threatened or endangered species or other species of concern in the project area. For example, botanical surveys require at least

two consecutive years of detailed surveys within a given location. Fishery surveys must be conducted over the entire life cycle of the species of concern; for salmonids this requires a multi-year survey. The biological resources for each alternative reservoir site, conveyance facility, potential road relocation, and recreation facility must be surveyed in detail to provide a fair basis for comparison in selecting the least environmentally damaging alternative.

Public Involvement

Compliance with CEQA/NEPA requires public involvement, and program participants decided early on in the process to go beyond minimum requirements. In April 1998, DWR established a Technical Advisory Group to assist DWR staff in developing study plans. The TAG meetings are held bimonthly to review work in progress and comment on the content and adequacy of various elements of the investigation. The group consists of interested parties from federal, State, and local agencies, as well as environmental groups, and property owners in the project area. (See the North-of-the-Delta Offstream Storage Investigation Progress Report for a listing of TAG members.)

Program participants have briefed local entities frequently during the course of the investigation. DWR, in cooperation with CALFED, has held public workshops and meetings to provide information about the proposed reservoir alternatives and to answer questions about the investigation. Public workshops will continue periodically throughout the duration of the program.

In November 1999, a technical briefing and tour of the Sacramento River and Sites Reservoir was provided to Legislative and Governor's Office staff. During this tour, information was provided on the Sacramento River ecosystem restoration, geomorphology, conveyance alternatives, biological field surveys, and geologic and seismic findings at Sites Reservoir. Additional briefings and public involvement activities will continue as the investigation proceeds.

The Alternatives

Studies conducted in the last two years have provided valuable engineering and biological data to the North-of-the-Delta Offstream Storage Investigation and helped refine the four alternatives. These studies, along with the work over the next several years, will be instrumental in determining the most feasible alternative, complying with CEQA/NEPA, and planning mitigation measures for the preferred north-of-the-Delta offstream storage program. The alternatives are described below. At the end of this summary is Figure S.3, a map showing the four alternatives in the context of the watersheds for each of the storage alternatives.

- Sites Reservoir would be located about 10 miles west of Maxwell and formed by constructing dams on Stone Corral Creek and Funks Creek. Two alternate Sites Reservoir sizes are being evaluated, 1.2 million acre-feet and 1.8 maf. A larger

1.8 maf Sites Reservoir would require construction of nine additional saddle dams along the southern edge of the Logan Creek watershed.

- Colusa Reservoir is a 3.0 maf proposal that would include the area inundated by the 1.8 maf Sites Reservoir, plus the adjacent watersheds to the north: Logan and Hunter Creeks. Most of the land in the Sites and Colusa Project areas are now used for grazing or dry-farming grain because little water is available for summer irrigation.

Flood flows from the Colusa Basin Drain, the Sacramento River, and local tributaries are potential sources of water supply for the Sites and Colusa Projects. Using the Colusa Basin Drain floodflows would reduce local flooding in the Colusa Basin.

For Sites and Colusa Reservoirs, 14 alternative conveyance facilities are being evaluated to convey Sacramento River and Colusa Basin Drain floodflows to the reservoirs. These conveyance facilities include the existing Tehama-Colusa Canal and Glenn-Colusa Canal. Enlargement of these two canals is also being considered. Two gravity flow conveyance alternatives are also being studied for diverting flood flows from Stony Creek at Stony Gorge and East Park Reservoirs to Sites and Colusa Reservoirs.

- The Thomes-Newville Project, upstream of Black Butte Reservoir, would be about 15 miles west of Orland. Newville Reservoir would be formed by constructing a dam on the north fork of Stony Creek and a small saddle dam at Burrows Gap. Two alternative reservoir sizes are being evaluated, 1.9 and 3.0 maf. The Newville Reservoir would be supplied by Stony Creek, Thomes Creek, other local tributaries, and the Sacramento River.

Thomes Creek is the primary water supply source of the Newville Reservoir. However, conveyance alternatives to carry flood flows of Stony Creek (from Black Butte) and the Sacramento River are also being considered. Prior Thomes-Newville Project studies included a diversion dam on Thomes Creek. Current planning challenges include investigating a diversion facility that would allow anadromous fish migration in Thomes Creek while allowing the creek's floodflows to be diverted to Newville Reservoir. Thomes-Newville conveyance facilities planning is not yet complete.

- The Red Bank Project would be about 18 miles west of Red Bluff. This project consists of constructing two major dams to create 350,000 acre-feet of storage in Dippingvat Reservoir on South Fork Cottonwood Creek and Schoenfield Reservoir on Red Bank Creek. Most of the water supply for this project would come from South Fork Cottonwood Creek because the Red Bank Creek flows upstream of Schoenfield are inadequate for this project. Flood flows would be

diverted for short-term storage in Dippingvat and then diverted to Schoenfield, the main storage reservoir. However, because of the importance of South Fork Cottonwood Creek to Sacramento River health and fishery production, CALFED has removed Dippingvat Reservoir from its list of surface storage options under consideration. This alternative would consist of a diversion dam on South Fork Cottonwood Creek, and a canal and pumping plant to convey water to Schoenfield Reservoir.

Preliminary Findings and Recommendations

Although much work is yet to be completed under this investigation, analyses completed thus far have provided important insights and led to some initial conclusions highlighting additional work that must be done. Figure S.4 shows a timeline of activities to date and future activities. (See Chapter 7 of the North-of-the-Delta Offstream Storage Investigation Progress Report for specifics about completed and future activities.) Below are preliminary findings and recommendations based on analyses completed by the end of 1999.

- North-of-the-Delta offstream storage can improve water supply reliability for all users. Potential project benefits include increased operational flexibility, improved water quality, reduced flooding, additional water supply to meet agricultural, urban, and environmental demands, cooler water for Sacramento River salmon, and ecosystem benefits.
- Engineering and geological investigations conducted at Golden Gate and Sites dam sites indicate that these locations are suitable for construction of dams impounding a 1.8 maf Sites Reservoir.
- The dominant Natural Plant Community in the Sites, Colusa, and Thomes-Newville project areas is California annual grassland. The Red Bank Project area is dominated by blue oak, mixed oak, foothill pine, and chaparral. Sites Reservoir contains a greater diversity of habitat type and woodland than found in the Colusa Cell. The Thomes-Newville Project area has more density and diversity of species than Sites Reservoir. By far, the Red Bank Project area has the most diversity of species than the other three alternative reservoir sites.
- Habitat for the valley elderberry longhorn beetle occurs in each of the four proposed reservoir sites. VELB emergence holes were found within the proposed Sites and Newville Reservoir areas. No emergence holes were found within the proposed Colusa Cell and Red Bank Project areas. No adult beetles were observed at any of the proposed reservoir sites.
- Jurisdictional wetlands and waters of the U.S. are present in all four reservoir areas. The Newville Reservoir area with 413 acres of jurisdictional wetlands and 231 acres of other waters of the U.S. has the most acreage of all four reservoir areas.

- Review of existing databases indicated that nine State and federally listed avian species could be found within the counties covering the west side of the Sacramento Valley and foothills. Three of these species were identified during field surveys including sporadic wintering use by both adult and immature bald eagles, which have been documented at each of the four reservoir sites. A single sighting of a bank swallow was made near the proposed Colusa site. Five sandhill cranes were observed flying over the Colusa Project area during November 1997.
- The streams flowing through the proposed Sites Reservoir and Colusa Cell are warm water streams with poor water quality. These are generally intermittent streams that do not support habitat for anadromous fish. Sampling of game and non-game fishes within these streams found very few fish above 150 millimeters long, suggesting that fish only rear in these areas. Hitch was the most abundant fish found in both reservoir areas.
- Thomes Creek was surveyed in 1980-81, 1981-82, and again in 1999 for the presence of salmon and steelhead. Fall and late fall-runs of salmon and steelhead were seen during these surveys. In the 1999 survey, one adult spring-run chinook salmon was also found.
- State Department of Fish and Game staff estimates that Cottonwood Creek supports a good population of steelhead. Steelhead were also found in Red Bank Creek within the footprint of Schoenfield Reservoir. Fall-run and late fall-run chinook salmon were found by DFG staff in lower Cottonwood Creek from the mouth to the confluence of the North Fork Cottonwood Creek. Spring-run chinook salmon migrate upstream in April and spend the summer in deep pools in the south and north fork of Cottonwood Creek.
- No threatened or endangered amphibians were found within the Sites, Colusa, or Thomes-Newville project areas. A single California red-legged frog was found in the Red Bank Project area.
- Fish species found in Cottonwood Creek are more diverse than in streams flowing through other alternative reservoir sites. Spring-run chinook salmon and steelhead were sampled in South Fork Cottonwood Creek where the proposed Dippingvat Reservoir would be located. Much more diverse habitat and species were also present within the Schoenfield Reservoir area.
- The natural flow of Red Bank Creek at the proposed Schoenfield Reservoir averages about 16,000 acre-feet per year. This flow is inadequate to justify construction of Schoenfield Reservoir without additional water supplies from South Fork Cottonwood Creek. Diversion of Cottonwood flood flow to Red Bank Project is infeasible without construction of a diversion dam on South Fork Cottonwood Creek. Therefore, it is recommended that the Red Bank Project studies be discontinued.

- Red Bank Creek is proposed to convey Schoenfield Reservoir water to the Tehama-Colusa Canal. Seepage of project water in Red Bank Creek may be excessive, making it an infeasible conveyance alternative.
- The embankment-to-storage ratio for the Colusa Cell is very high, increasing the project cost and unit cost of water considerably. The high costs are primarily due to the very large embankments required for construction of four main dams and seven saddle dams that would form the Colusa Cell. Therefore, it is recommended that further studies of the Colusa Project be deferred until an economic feasibility study of the project is completed. If economic feasibility evaluations indicate the Colusa Cell is feasible, engineering and environmental studies may be continued later.
- The environmental documentation process for the North-of-the-Delta offstream storage project should start this year if additional north-of-the-Delta offstream storage is consistent with CALFED's preferred program alternative as discussed in the Bay-Delta Program final programmatic EIS/EIR and Record of Decision.

Figure S.2
Offstream Storage Investigation – Draft Workplan

ID	Task Name	1998				1999				2000				2001				2002				2003				2004			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Project Management																												
2	Public Workshops and Meetings																												
14	Project Management																												
15	Project Coordination																												
16	TAG Meetings																												
54	Basic Data																												
55	Aerial Photography and Mapping																												
56	Collect Basic Data																												
57	Create and Maintain GIS Database																												
58	Right-of-Way and Surveying																												
59	Land Surveys and Mapping																												
60	Determine Properties Needed for ROW																												
61	Negotiate New Right-of-Entry Permits																												
62	Coordinate Needs for Right-of-Entry Permits																												
63	Coordinate Field Activities and Access																												
64	Negotiate Settlement for Damage Claims																												
65	Engineering Feasibility Studies																												
66	Operation Studies																												
67	Hydrology Studies																												
68	Flood Control Studies																												
69	Develop Operation Criteria																												
70	Foundation Investigation																												
71	Borrow Material Investigation																												
72	Seismic Analyses																												
73	Design Earthquake Determination																												
74	Conveyance Facility Evaluation																												
75	Stream Diversion Facilities																												
76	Yield Determination																												
77	Seepage Studies																												
78	Embankment Design																												
79	Outlets/Spillway Design																												
80	Pumping/Generation Design																												
81	Power Transmission Facilities																												
82	Highway and Utility Relocations																												
83	Recreation Facilities Study																												
84	Water Demand/Release Analyses																												
85	Groundwater/Conjunctive Use																												
86	Storage Integration Investigation																												
87	Develop Project Formulation																												
88	Economic Studies																												
89	Sediment Studies																												
90	Energy Analysis																												
91	Relocation Investigations and Land Costs																												
92	Develop Optimum Project Configuration																												
93	Develop Water Exchange Programs																												
94	Develop Financing Plan																												
95	Draft Feasibility Report																												
96	Final Feasibility Report																												

Notes: 1998 = Fiscal Year 1997-98, etc.

1997-98 work was conducted under proposition 204 authorization.

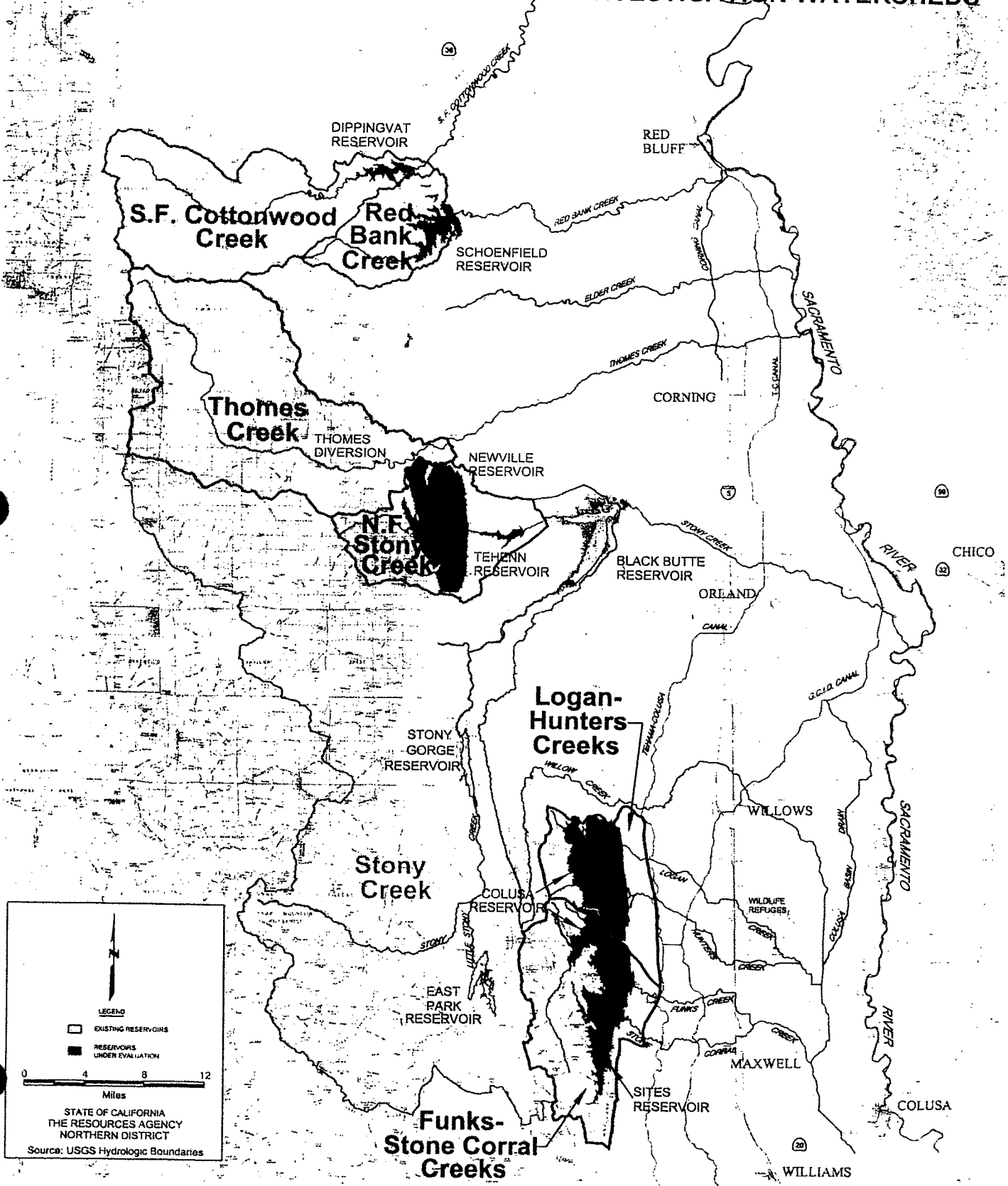
* Includes both threaten, endangered, and general species.

Figure S.2
Offstream Storage Investigation – Draft Workplan

ID	Task Name	1998				1999				2000				2001				2002				2003				2004			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4				
97	Environmental Documentation																												
98	Environmental Field Studies																												
99	Map of the Study Area																												
100	Map of the Study Area																												
101	Map of the Study Area																												
102	Map of the Study Area																												
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107	Map of the Study Area																												
108	Map of the Study Area																												
109	Map of the Study Area																												
110	CEQA and NEPA Process																												
111	Notice of Preparation																												
112	Scoping Meetings																												
113	Scoping Report																												
114	Administrative Draft EIR/FIS																												
115	Draft Mitigation and Monitoring Plan																												
116	Prepare & Review Public Draft EIR/FIS																												
117	Release Public Draft EIR/FIS/Comment Period																												
118	Final Mitigation and Monitoring Plan																												
119	Final EIR/FIS																												
120	Notice of Determination/Record of Decision																												
121	Regulatory Compliance and Permits																												
122	Section 404 Clean Water Act/401 Certificate																												
123	Preapplication Consultation																												
124	Environmentally Least Damaging Alt Analysis																												
125	Apply for 404 Permit/401 Certification																												
126	Historic Preservation Act																												
127	Mitigation and Monitoring Plan																												
128	Receive 404 Permit																												
129	Receive 401 Water Quality Certification																												
130	Other Permits and Compliances																												
131	1601 Agreement																												
132	Water Rights Application																												
133	Dam Safety Certification																												
134	State Lands Permit																												
135	Storm Water Permit																												
136	FERC License Process																												
137	Incidental Take Permit Tasks																												
138	Informal Consultation																												
139	Tiered Biological Assessment/NCCP																												
140	Formal Consultation																												
141	Mitigation Plan/Monitoring																												
142	Receive Biological Opinion																												

Notes: 1998 = Fiscal Year 1997-98, etc.
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NORTH OF DELTA OFFSTREAM STORAGE INVESTIGATION WATERSHEDS



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Figure S-4. Project Timeline